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BRIEFS

COLD OIL. In extremely cold temperatures, oil can thicken to the point where it may not be pumped into the engine during start-up or takeoff. When this happens, overheating from oil starvation is imminent. One pilot who took off without preheating, after an overnight temperature of -30°F, had his engine seize after only three minutes of flight. Take the time to preheat (following aircraft and engine manufacturers' recommendations) to "loosen up" the oil, and make sure oil temperatures are in the green before takeoff.

AMENDED MAINTENANCE. New amendments to FAR Part 43 (Maintenance, Preventive Maintenance, Rebuilding, and Alteration) include for the first time description of the terms "overhaul" and "rebuild" as applied to airframe, engine, etc. An item signed off as overhauled or rebuilt must meet all the conditions of those terms (43.2). Also, Canadian mechanics may now perform all inspections except the annual on U.S.-registered aircraft (43.17). Details of more Part 43 amendments in an upcoming issue.

FLEXING ROTORS. Changes in the airworthiness standards of newly designed helicopters, for which application for type certification is made after 3/2/83, will relate performance to passenger capacity. Example: multi-engine transport helicopters carrying 10 or more passengers must be capable of continued safe flight if one engine fails. However, the "height-velocity" requirements for helicopters carrying less than 10 will be relaxed. New helicopter icing standards require protection only at altitudes normally flown.

WINTER GEAR NEEDS. In the season of runway slush, check retractable landing gear to see that shields, boots, and curtains that protect actuating devices and switches from harmful accumulations are doing their job. In colder climates oleo struts on fixed or retractable gear should be serviced with nitrogen; otherwise ice crystals can form in the hydraulic fluid and cut the seals, causing leaks. During preflight remove ice or slush from struts and wipe off with rags soaked in hydraulic fluid to discourage freezing.

DE-PANTSING. Wheel fairings, or "pants" should be removed for winter or early spring operations to avoid inadvertent braking and skidding. Mud or snow build-ups from wet, slushy runways can freeze hard against the tires overnight, or in flight after takeoff, and lead to loss of control.

GROUND ICING

The importance of getting off the ground with a clean airplane

De-icing and anti-icing are two procedures for preparing an aircraft for winter takeoffs which have tragically confused many pilots. Air craft of all types, from two-place trainers to large carrier jets have crashed after attempting to take off with critical airfoil surfaces distorted by frozen accumulations that prevented sustained flight. The fatality rate of these types of accidents is very high.

In many cases the pilots in command assumed falsely that their aircraft was protected from icing during ground or takeoff maneuvers because of the "anti-icing" treatment it had been given. This confusion arises from the fact that the same type of chemical compound, essentially ethylene glycol, is used in both de-icing and anti-icing procedures.

De-icing, for aircraft, means removal of frozen adherents to wings, tail, propeller and fuselage. There are various techniques, most of which involve the application of heat in one form or another: hot air blowers, heated hangars, or hot aqueous solutions of ethylene glycol, usually applied under pressure from the nozzles of movable cranes, or "cherry pickers." The approved ratio of ethylene glycol to water in solution should result in a mixture freezing point at least 20° F below ambient or surface temperature, whichever is lower. To date these solutions are not approved for rotorcraft.

It is important to understand that it is the heat of the aqueous solution—not the presence of the chemical—which removes the ice. Hot water alone would work just as well. Ethylene glycol does not dissolve ice. Its function is to lower the freezing point of the residue liquid so that it does not refreeze before takeoff—especially in hard-to-see areas, like drain holes, static ports, or control hinges.

Anti-icing of aircraft means the application of ethylene glycol in *strong solution or at full strength*, for the purpose of lowering the freezing point of any new precipitation it comes into contact with. Note that the solution does not bond itself to the aircraft surfaces in any lasting manner. In fact, most of it runs off quickly, leaving only a very thin, temporary coating. Snowmelt combining with the chemical will have its freezing point lowered somewhat. The effective time frame or duration of anti-icing protection is impossible to calculate, as it depends on a host of factors such as ambient temperature, fluid strength, precipitation rate, assumed water content of snow or ice, surface film thickness of anti-icing material, wind chill factor, etc. The aircraft could be protected for less than two minutes or more than two hours.

The only certain means of knowing whether an aircraft is safely ice free prior to takeoff is visual inspection of the exterior.

This is not always convenient, especially after delays have taken place at the ramp, when taxiing, or while awaiting approval for takeoff. Nevertheless it is the pilot's responsibility to ascertain, before taking the runway, that he is in compliance with FAR 91.209: This Federal Aviation Regulation states that no pilot may take off an aircraft that has:

(1) Frost, snow or ice adhering to any propeller, windshield, or power plant installation, or to an airspeed indicator, altimeter, rate of climb or flight attitude instrument system;
(2) Snow or ice adhering to the wings, or stabilizing or control surfaces; or
(3) Any frost adhering to the wings, or stabilizing or control surfaces, unless that frost has been polished to make it smooth.

Aircraft performance is degraded not only by the increased loads and imbalance caused by icing, but (more importantly) also by the aerodynamic disturbance of distortions in the airfoil. Wind tunnel tests have shown that ice, frost, or snow accumulations on the leading edge and upper surface of a wing, having a thickness and surface roughness similar to medium or coarse sandpaper, can reduce wing lift by as much as 30 percent and increase drag by 40 percent. Pilots of iced aircraft have found that, following takeoff, once they rose above ground effect they could no longer sustain flight or maneuver the aircraft without stalling and losing control.

Hence the importance of a pre-takeoff inspection when delays have occurred after leaving

Thorough ice removal outdoors requires heated pressurized spray.

Icy stubble left by manual scrubbing can destroy lift.

the ramp. As getting out of the airplane may not be practical at this point, all possible viewing advantage should be taken of windows, doors, hatches, etc., turning on wing or navigation lights as needed to conduct an external inspection. If under any circumstances the pilot cannot ascertain that critical surfaces are clean, takeoff should not be attempted.

The assumption that because an aircraft has been treated with a de-icing procedure any new buildup on the wings is "just loose snow that will blow off on departure" has led to fatal consequences. Icing accidents are relatively few but the fatality rate is high. Victims are often pilots who are operating in unfamiliar weather conditions, for which they have had no practical training.

A typical accident of this kind occurred in January at Jackson Hole (WY) Airport where a lawyer/pilot had taken his family for a skiing holiday.

The attorney had departed from his home airport at Memphis, TN in a Cessna 210, with his wife and two teenage daughters and all of their ski equipment on board. They had arrived at Jackson Hole on a Wednesday and were scheduled to return on the following Sunday. During this four day period, when the 210 was tied down outside, there were several light snowfalls, with sunny days and freezing nights.

When the lawyer returned to his airplane on Sunday morning, with the temperature barely out of the teens, he found a considerable accumulation of ice firmly adhering to the wings, He arranged for a de-icing treatment with the FBO, while he went into the terminal with his family to have breakfast and file his flight plan.

The 9:00 a.m. weather for Jackson was reported as 1,500 feet overcast, visibility four miles, light snow, temperature 22° F. The pilot filed IFR for North Platts, NB via Victor 298.

The 210 was de-iced, fueled, loaded and ready for takeoff by 10:00 a.m. The pilot boarded with his family at approximately 10:30. One of the line attendants offered to find him a broom and a ladder to remove the fresh accumulation of snow on the wings, but the pilot declined, saying that the aircraft "...had just been ice-treated, and the snow would blow off as they taxied." He departed from Runway 18 at 10:41.

Soon afterwards the single-engine aircraft was observed turning to the left and circling the area, apparently to gain altitude to clear the 10,000 foot peaks that rimmed the basin. However the climb rate appeared very slow, and at one point a pilot on the ground thought the airplane was returning to land. Then it disappeared in the swirling snow.

Late that afternoon a ranger in Grand Teton National Park, directly north of Jackson, was traversing a snow-covered meadow on skis when he came upon the tip of an aircraft tail. The wreckage of the 210 was buried under the snow, and there were no survivors.

During the subsequent investigation, laboratory tests disclosed no evidence of engine or mechanical failure. However, a large area of the wing and horizontal stabilizer surface was coated with approximately one/quarter inch of frozen sleet at the time of discovery. The probable cause was determined to be "Inadequate flight planning, airframe icing."

Conversations with persons who had known the pilot confirmed the belief that he had never taken off under icing conditions before, nor had he any previous experience with de-icing or anti-icing procedures.

The "clean aircraft before takeoff" rule applies to all types of airplanes, including those which have been certificated and equipped for flight in icing conditions. Ice, frost or adhering snow that is formed on airplane surfaces on the ground is not removed by the airplane's de-icing equipment—in fact, such accumulations may render the de-icing equipment incapable of performing normally.

The cleanest airplane in the world, at the ramp, may be heavily dirtied up with slush and ice muck by the time it reaches the runway, if there is considerable snow and slush on the field and adequate separation is not maintained during taxiing. In fact, in snowy conditions some pilots intentionally taxi as close as possible behind jets or other large aircraft in hopes of getting a free de-icing job from the jet or prop blasts of the aircraft ahead. This is a false economy in many ways. Existing ice will not be removed, but additional slush and muck will be thrown up on the airplane, especially on the underside of the wing. Important orifices such as pitot tubes or static ports can be sealed shut, falsifying the readings of airspeed and turn-and bank instruments. The engine PT-2 inlet probe of jet engines (part of the total engine pressure indication system) could be similarly affected. Keep your de-iced airplane clean by maintaining as much distance as possible between you and the plane ahead.

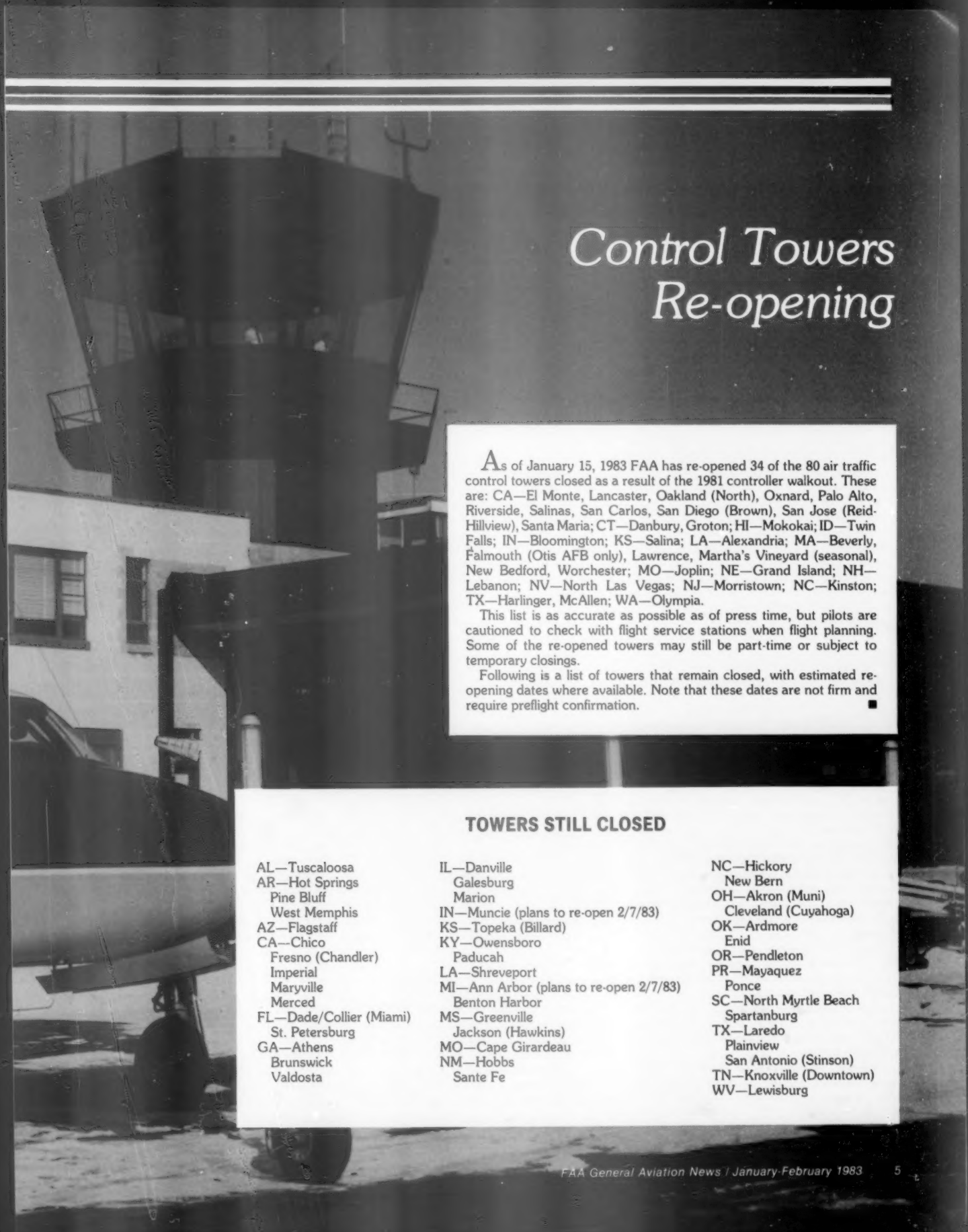
Note: make sure that all ice deposits are dislodged from propellers (or rotor blades) before starting engines. Uneven icing can throw a blade out of balance and cause it to set up such severe vibrations that it will snap. Furthermore, ice particles shed from rotating components under centrifugal and aerodynamic forces can virtually "shred" an airplane, and the effect on human beings in the area can be lethal.

A recently published study, "Winter Operations Guidance for Air Carriers—and Other Adverse Weather Topics," is available for examination at Flight Standards District Offices. It was prepared by FAA's Office of Flight Operations in Washington, D.C.

For additional information send for FAA's Advisory Circular No. 20-117, "Hazards Following Ground De-icing and Ground Operations in Conditions Conducive to Aircraft Icing." Free from the DOT Publications Section, M-443.1, Washington, DC, 20590.

See also FAA Advisory Circular 91-13C, "Cold Weather Operation of Aircraft," and AC 91-51, "Airplane De-Ice and Anti-Icing Systems." Free, same address. ■

Grand Teton peaks tower over 14,000' near Jackson Hole, Wyoming.



Control Towers Re-opening

As of January 15, 1983 FAA has re-opened 34 of the 80 air traffic control towers closed as a result of the 1981 controller walkout. These are: CA—El Monte, Lancaster, Oakland (North), Oxnard, Palo Alto, Riverside, Salinas, San Carlos, San Diego (Brown), San Jose (Reid-Hillview), Santa Maria; CT—Danbury, Groton; HI—Mokokai; ID—Twin Falls; IN—Bloomington; KS—Salina; LA—Alexandria; MA—Beverly, Falmouth (Otis AFB only), Lawrence, Martha's Vineyard (seasonal), New Bedford, Worchester; MO—Joplin; NE—Grand Island; NH—Lebanon; NV—North Las Vegas; NJ—Morristown; NC—Kinston; TX—Harlinger, McAllen; WA—Olympia.

This list is as accurate as possible as of press time, but pilots are cautioned to check with flight service stations when flight planning. Some of the re-opened towers may still be part-time or subject to temporary closings.

Following is a list of towers that remain closed, with estimated re-opening dates where available. Note that these dates are not firm and require preflight confirmation. ■

TOWERS STILL CLOSED

AL—Tuscaloosa
AR—Hot Springs
Pine Bluff
West Memphis
AZ—Flagstaff
CA—Chico
Fresno (Chandler)
Imperial
Maryville
Merced
FL—Dade/Collier (Miami)
St. Petersburg
GA—Athens
Brunswick
Valdosta
IL—Danville
Galesburg
Marion
IN—Muncie (plans to re-open 2/7/83)
KS—Topeka (Billard)
KY—Owensboro
Paducah
LA—Shreveport
MI—Ann Arbor (plans to re-open 2/7/83)
Benton Harbor
MS—Greenville
Jackson (Hawkins)
MO—Cape Girardeau
NM—Hobbs
Sante Fe
NC—Hickory
New Bern
OH—Akron (Muni)
Cleveland (Cuyahoga)
OK—Ardmore
Enid
OR—Pendleton
PR—Mayaquez
Ponce
SC—North Myrtle Beach
Spartanburg
TX—Laredo
Plainview
San Antonio (Stinson)
TN—Knoxville (Downtown)
WV—Lewisburg

WINTER FUEL PROBLEMS

The number one enemy is H_2O

Engine failure arising from water-contaminated fuel can be a serious problem for aircraft of all types, including turbojets. In winter the sharply contrasting day/night temperatures are often responsible for a higher concentration of water in fuel tanks, especially for aircraft serviced from storage tanks which are not regularly inspected and provided with a sump drainage.

The nature of water contamination is not fully understood by many persons who handle fuel, including pilots. Moisture is present in some degree in virtually all stored fuel, in the form of tiny suspended droplets. This is called entrained water, and it is not harmful as far as fuel flow or combustion is concerned, as long as it stays in solution.

However, entrained water gradually settles out at the bottom of the fuel container where it forms a layer of "free water." This can form a very serious blockage to fuel flow, especially at freezing temperatures, and even rupture lines. The rate at which free water forms in fuel is directly proportional to reduction in temperature.

Even at constant temperature the time required for free water to appear in fuel samples can be deceptive. Samples of fuel taken from an aircraft fuel strainer or gascolator through quickdrain valves, soon after fueling, may be negative; but the same test performed several hours later could show an alarming quantity of water.

The movement of water through the fuel system of an aircraft can also be deceiving. Free water tends to accumulate in the sump areas of tanks, and may not show up in the carburetor area until considerable flow has occurred. In a field test involving a four-passenger high-wing aircraft, no less than three gallons of water were added to the half-filled fuel tanks. A cupfull (eight ounces) of fuel was then drained from the fuel strainer, with no evidence of water. Only after 10 ounces was drawn off did water appear. Drainage was continued through the strainer and belly drains until there was no further sign of water. The tank sump drain then produced about *nine ounces of water*.

With some tailwheel airplanes, raising the tail to level flight attitude may result in an additional flow of sump water to the main fuel strainer. However, for most light aircraft it is practically impossible to drain all the water from the tanks through the lines. *The sumps should be drained regularly*, more often in winter.

The use of quickdrains at the sumps or strainers makes it possible to check for free water easily and thoroughly. Use a clean, transparent container that will hold at least 16 ounces of fluid and look for a clear layer at the

. . . many pilots have become reluctant to top off tanks at night, out of fear of finding them, next morning, drained by thieves.

base. (Water sensitive testing papers are also available.) Continue draining until no more water can be seen. On certain aircraft having fuel tanks located in each wing, positioning of the fuel tank selector valve to "Both On" position may not adequately drain the system. It may be necessary to position the fuel selector valve toward each tank in turn.

Turbine engine fuel is more dense and has a greater viscosity (resistance to flow) than gasoline. Impurities such as water or fine particles of rust can take from five to ten times as long, or even longer, to settle out in kerosene as in gasoline. Furthermore, turbine engine fuel controls and pumps are generally more sensitive than the fuel systems of the piston engine. Their fuel feed and pumping systems must work harder. Tolerances are closer and fuel pressures higher. The higher altitudes at which jets fly mean exposure to colder weather (temperatures as low as minus -50° below zero F) and greater susceptibility to freezing.

Because of these considerations the tolerable contamination levels for jet fuels are much lower than for Avgas. Even at the same contamination levels the greater volume of fuel use by turbines results in greater amounts of contaminants being deposited in the turbine engine system.

Some jet fuels have a fairly colorless appearance which may make it difficult to identify free water. Commercial products to test for jet fuel contamination are available. Here is a simple test procedure that has proved to be effective:

- Obtain an unchipped, spotlessly clean, white enameled bucket (approximately ten quart size).
- Drain about four to five inches of jet fuel from the sump to be tested.
- With a clean mixing paddle, stir the fuel into a swirling "tornado-shaped" cone. Remove paddle. As the swirling stops, the solid contaminants will gather at the center of the bucket bottom.
- Add several drops of household red food dye. The dye will mix with water and any solids at the bottom of the bucket. It will not mix with fuel. If no water is present the dye will settle to the bottom of the bucket.

Should contamination persist, have your aircraft fuel system inspected by a qualified maintenance technician.

Most pilots know that it is usually advisable to top off fuel tanks immediately following completion of a flight. Partially empty tanks means large quantities of enclosed air. The more air, the greater the condensation of moisture against the inside of the tank when the nighttime winter chill sets in.

In some cases, where payloads and itinerary for the next flight indicate that less than full tanks might be desirable, fueling may have to be delayed until the day of departure. This could make it difficult or impossible to test accurately for water contamination before takeoff.

In these circumstances pilots should take precautions to assure the quality of the fuel they are serviced with. Air carrier operators are required by law to develop and abide by an FAA-approved set of procedures for fuel storage tank inspection, to assure freedom from harmful contamination. Although many general aviation suppliers also follow FAA recommendations for periodic inspection of delivered and stored fuel, compliance is not mandatory. Pilots may always request storage tank inspections when they believe it is in the interest of safety.

For example, one type of storage tank inspection which a pilot may request consists of placing a sample of stored fuel into a clean and dry clear-glass container of at least one-quart capacity. After allowing the air cloud to rise, sample is visually examined for a "clear and bright appearance. These terms have no relation to the natural color of the fuel or any dye coloring which may have been added. Clear means the absence of any sediment or rust. Bright refers to the fluorescent appearance of fuel which has no cloud or haze, such as that caused by fine water droplets (from entrained water). Free water can also be detected as a separate layer on the bottom of the container. It is helpful to swirl the container so that a vortex is created. The free water and dirt, if present, will tend to collect at the bottom of the vortex.

Chain link fence, guard dog discourage night fuel thievery.

For stored jet fuels, the "white bucket" test already described is used, except that water-indicator paste or paper are used in place of dye.

In recent years, with the sharp rise in aviation fuel prices, many pilots have become reluctant to top off tanks at night, out of fear of finding them, next morning, drained by thieves. This is a difficult problem to address. The convenience that quickdrains afford aircraft owners also serves to ease the task of the fuel robber. At this writing lockable drains do not appear practical. Aircraft storage in locked hangars or at tie-downs of airports with an alert 24 hour security guard offer possible solutions.

Aircraft like jets and some turbo-charged multi-engine piston airplanes which commonly fly long distances at high altitudes have experienced problems with fuel icing. As a preventive measure, some manufacturers have approved the use of certain anti-icing additives (usually ethylene glycol mono-methyl ether, or isopropyl alcohol) in a specified manner. **Caution:** no fuel additives should be used except under direction of a service letter from the appropriate aircraft manufacturer. Some aircraft fuel systems have components which could be deteriorated by certain additives.

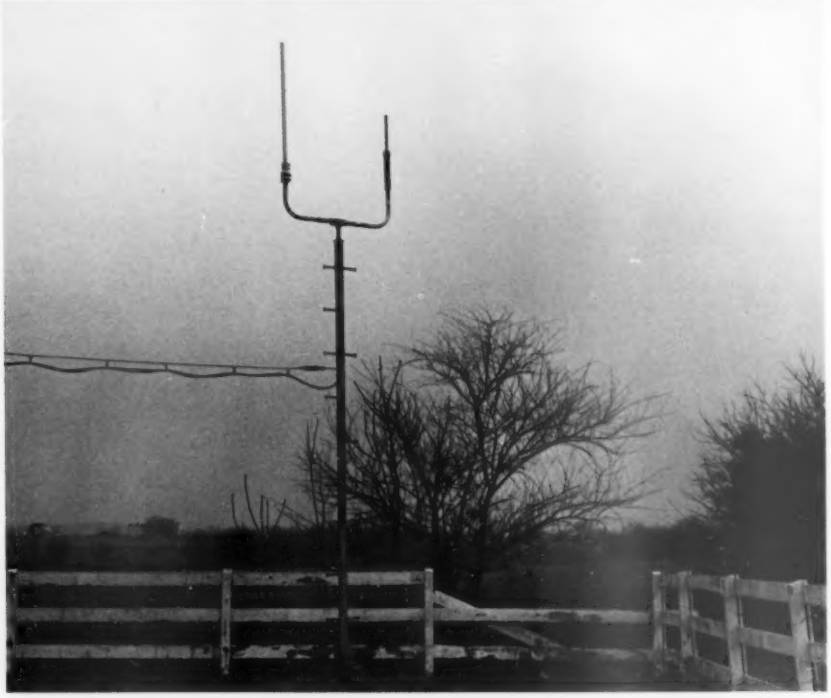
Refueling from drums or cans should be avoided whenever possible. Since such containers are frequently re-used, any identification they bear is suspect, as is their freedom from contamination.

The often chilly conditions on the flight line in winter predispose us to complete all preflight operations hastily and repair to the warmth of the cockpit as soon as possible. No doubt it is a great temptation to observe the fueling service from the comfort of a pilot lounge or cafe, and to dismiss the thought of contaminated fuel as needless worry. Not so. The fact is that nearly 100 "fuel quality" accidents happen every year, and water contamination is by far the largest culprit.

Keep your power dry. ■

Long Distance Radio Reception

Remote Control Outlets extend range of Air Traffic Service



In view of current plans to reduce the nationwide network of 317 flight service stations to 61 ultra-sophisticated "hub" stations, some pilots have worried about how they will be able to communicate with a distant FSS in an emergency.

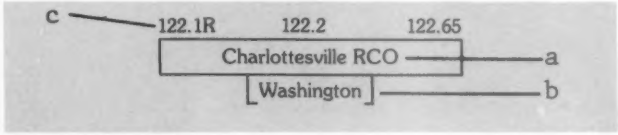
As the number of FSS's decreases, the average distance for radio communication for an aircraft in flight will obviously *increase*, with the possibility for intervening terrain also becoming greater. Does consolidation mean that pilots will lose access to FSS for en route weather advisories, clearances, etc., because they cannot reach a flight service station hundreds of miles away or beyond a mountain range? Will they not be able to contact flight service immediately in event of an emergency?

This certainly will *not* be the case, because Flight Service will continue to use (and expand) an existing system for extending its communications range: a network of 2,600 Remote Communications Outlets (RCO). Pilots have long used unmanned remote radio facilities to pick up IFR clearances, or to reach an especially distant FSS for VFR weather updates, or to open or close a flight plan.

For the pilot who may be unfamiliar with the remoting system, an RCO is an unmanned UFH or VHF radio communications facility on the ground, linked by landline to a controlling FSS. Established where air-to-ground communication coverage is inadequate because of distance or terrain, or for ground-to-ground radio communications where telephone contact is difficult, the outlet consists of an antenna and an instrument shelter that houses the transmitters and receivers. Most FSS have a network of such remoted outlets.

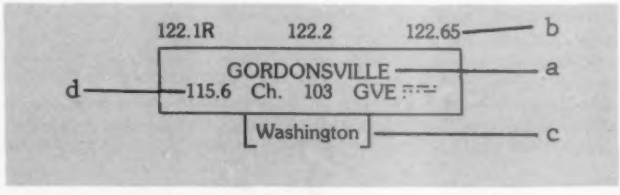
There are two basic types of remote communications outlets, determined by the number of transmitters and receivers at each site. Those RCO's with back-ups (having more than one transmitter and receiver) are used primarily for air-to-ground communications. The other type of RCO, which normally has only one transmitter or receiver, has a low repair priority and is therefore more susceptible to unexpected outages. This type is used where the remote station is desirable, although its operation is not vital to the safety of operations conducted in this airspace. Its primary purpose is to provide *ground-to-ground* communications between FSS specialists and pilots at satellite airports, for delivering clearances, relaying departure authorizations, and acknowledging IFR cancellations or departure/landing times.

RCO's are often located on or near airports or at VOR's (and at some NDB's in Alaska). An RCO associated with an airport will be indicated on sectional and low altitude charts thus:



This box tells us that at the airport at Charlottesville, VA (a controlled airport 92 miles southwest of Washington, DC) there is an RCO (a); that it is remoted to the Washington Flight Service Station (b); and that there are three frequencies for the pilot to choose from (c). However, 122.1R is "receive-only" at the FSS, and if the pilot elects to transmit on this frequency he should state which other FSS frequency he is listening on. (He can also listen on a nearby VOR channel. This is a holdover from earlier days when aircraft had transmitters and receivers on separate radios.) Pilots equipped with a modern transceiver and dual NAVCOMs may still opt to transmit on the receive-only frequency if they have difficulty contacting the FSS otherwise.

Another way an RCO is depicted on charts is:



This box identifies the NAVAID as the Gordonsville VOR (a), but it is also an RCO even though there are no words to that effect. This was formerly called an LRCO—Limited RCO—because some had receive-only or transmit-only capability over the VOR. The clues come from the frequencies listed *above* the information box (b) and the FSS identification *below* (c). The VOR (16 miles east of Charlottesville over a mountain ridge) provides a remoted radio connection to the Washington FSS, and the pilot again has choices for the frequency and method of communication: directly on 122.2 and 122.65 or by transmitting on 122.1R and listening on the VOR frequency (d)—115.6 in this example.

In addition to chart indications, this information can be found in the *Airport/Facility Directory*.

An RCO improves communicability with a flight service station by eliminating problems of terrain interference and distance. When the pilot broadcasts on the RCO frequency, his transmission is picked up by the RCO antenna and sent via landline (usually existing telephone lines) to the FSS. A reply from the FSS returns in the reverse—via landline then transmission from the RCO to the aircraft receiver (Figure 1).

For the quickest recognition of your needs when you call an FSS over an RCO, always include the name and/or frequency you are listening on. For example: "Washington Radio, Piper 1234, receiving Gordonsville VOR, over." or "Washington, Radio, Piper 1234, receiving (frequency)." This lets the specialist know which frequency—from among the several he monitors—you are listening for his reply on. He can then reply immediately on the appropriate channel.

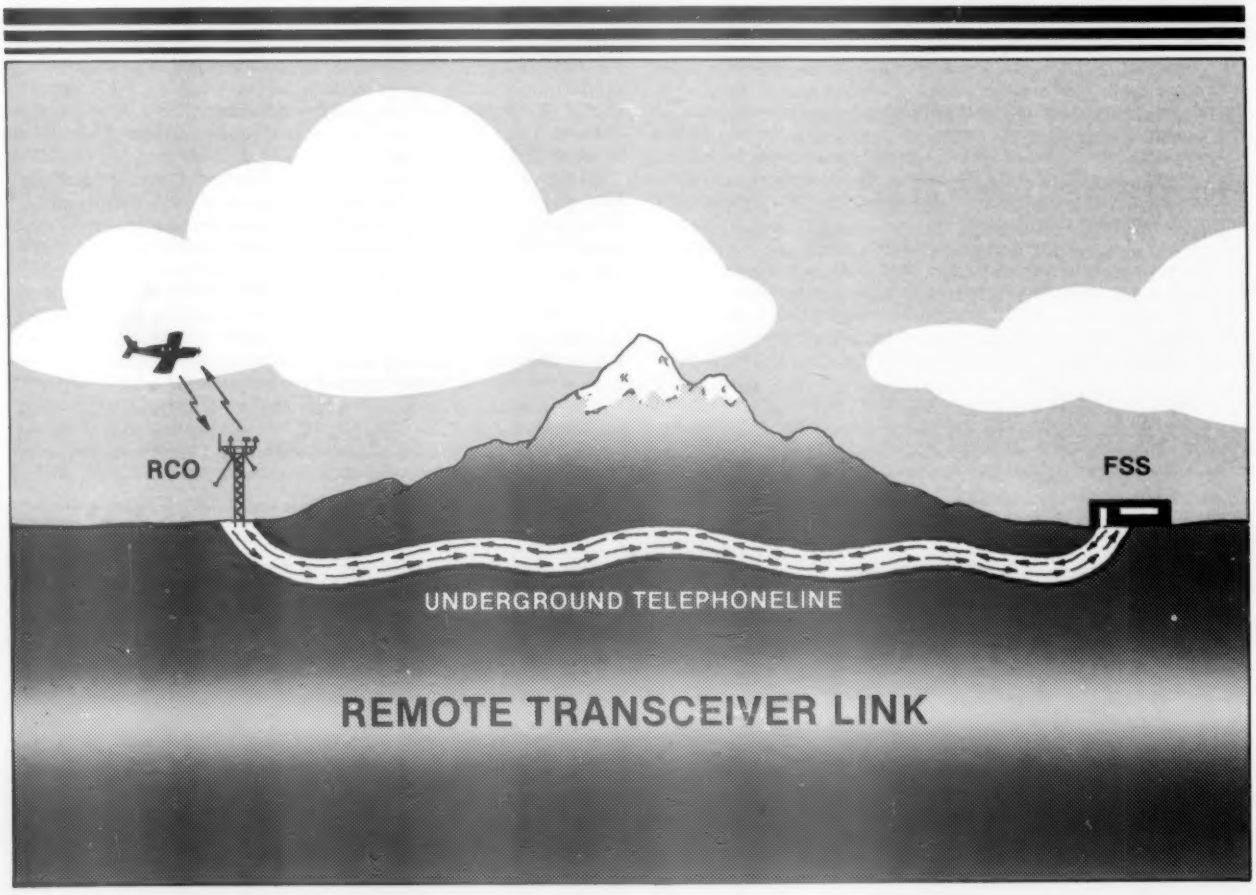
At part-time flight service stations, the RCO will usually be switched over, when the FSS is closed, to a nearby fulltime facility whose frequency will be indicated in the *Airport/Facility Directory*. If there is no other facility that the RCO can be switched to, it is NOTAMed as out of service when the FSS is closed.

Whether we know it or not, we use yet another "hidden" remote, especially in instrument flying. When flying through Center airspace, the sector frequencies which we are told to tune to are usually remotes (unmanned stations). Center airspace covers such large areas that remotes are necessary to ensure adequate communication with an aircraft that may be hundreds of miles from the Center's physical building. These remotes, called Remote Communications Air/Ground Facilities (RCAG), are not shown on charts familiar to most airmen. Controllers provide the frequency on handoffs.

Similarly, pilots at uncontrolled satellite airports who need contact a terminal facility some distance away, to obtain a takeof clearance for an IFR flight or to let approach control know they are about to take off, are actually using another "hidden" remote that automatically brings them up in the correct sector. The terminal frequencies published on low altitude charts, instrument approach procedures, and in the *Airport/Facility Directory* may really be for remotes called RTR's or Remote Transmitter/Receivers. RTR's are also not identified as such on charts. RCO's to flight service stations *are* indicated on charts because the pilot needs to be able to identify the specific FSS he is trying to communicate with.

With the continuing expansion of the RCO network as well as RTR's and RCAG's, pilots need have little concern about being able to communicate with the facility they need. Regardless of how the number of FSS's may diminish, they will be within radio range of general aviation aircraft everywhere.

"Service" is still the FSS' middle name. ■



Occupied Air

Keeping clear of military aircraft

On a crystal clear morning the flyer cruises along at 600 feet AGL at the astounding speed of 30 knots in his much-enjoyed ultralight. The air is calm and crisp, the little engine thrums steadily, and the relative wind sings through the craft's wire rigging. At peace and undisturbed, he is "into" the feeling of flying, watching the toy-sized trees and houses slowly slip past beneath him and feeling the air on his face. It is great to be alive and free to fly. . .

It is a CAVU day and the Northrop T-38A Talon *is performing perfectly at 600 feet AGL. The twin jet engines propel the craft along at a mind-wrenching 760 feet per second, and the pilot revels in the feel of power encasing his fragile body. His camouflage hides him from enemy eyes, and he homes in relentlessly on his pre-selected target. In his ears is the chatter of Flight Control and his wingman. His mind is filled with thoughts of bogeys and heat-seeking missiles and kill counts, and in every sinew he feels the throb of his powerplants. It is great to be alive and free to fly . . .*

The ultralight pilot glances about his wide-open environment and thinks how fortunate he is to be alone in all this beauty. Then, directly ahead in the distance just above the horizon, a tiny mote appears. "A fellow aviator," thinks the glider rider, "out to join me in the joy of flight. I'm slow-moving he's bound to see me." He looks away and smiles at the early morning sun reflecting off a stream, then looks forward again. The sky is now filled with gray and green and brown, and through his crash helment he hears a deafening roar. . .

The low-level terrain-following exercise has gone well. The military pilot has scored "hits" on all targets that were unfortunate to get themselves caught in his deadly rain of computer-simulated rockets and bullets. All in all, a great day. To take full advantage of its beauty, the jet jockey flicks his eyes away from his instruments to peer into the cobalt blue sky. Was that actually a flash of bright colors and a startled face he saw. . .?

As unlikely as such an encounter may seem, near misses between general aviation and military aircraft occur on the average of 140 times a year. It is highly possible that military aircraft in low-level training could encounter ultralights that operate basically in the same airspace—below 10,000 feet MSL over sparsely populated areas. The dangers are twofold: midair collision is the most obvious and potentially harmful to both vehicles; the other is exposing the sensitive ultralight to the wake turbulence of the speedier military aircraft.

Operators of the leisurely moving ultralights might be lulled into believing that their slow speeds make them more obvious than something moving at 250 knots. But it is the difference in the relative speeds that causes the problem. The faster craft's closure rate leaves little time for evasion: by the time the target is seen, identified, located, and evasive action selected it may be too late.

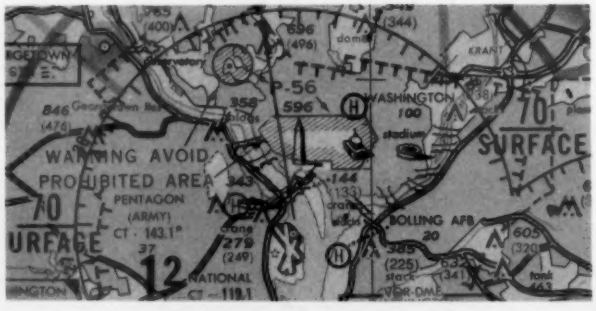
For example, at 250 knots or 422 feet per second, an aircraft will cover a mile in just under 12.5 seconds. Some military training aircraft can fly as fast as 540 knots or .8 the speed of sound. The closure rate for one in this case would be just *six seconds*. Further, even if evasive action is taken by either or both parties involved, the wakes left by the passage of the speedier craft can be damaging to the ultralight or light aircraft.

Simple solution—just stay away? If at all possible, but military aircraft conduct some training operations in airspace used by VFR and IFR aircraft and ultralight vehicles. Furthermore, certain blocks of airspace designated for military or special use may not be penetrated by civilian flyers without prior permission.

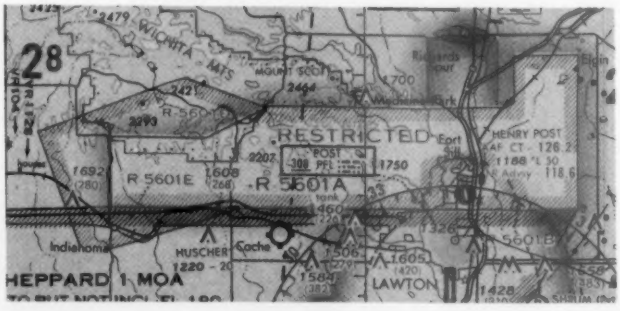
Military of special use airspace is depicted on sectional, terminal area, IFR, wall planning, and DOD area planning charts, so that the ultralight operator or aircraft pilot who wants to avoid them altogether or who wants to know where to expect military activity can readily obtain the information.

Although not strictly military, **Prohibited Areas** include security sensitive airspace from the surface up to a specific altitude. Under FAR Part 73 no aircraft of any kind are permitted in prohibited areas unless authorization is obtained from the using agency, but the security nature of these areas—the White House, Presidential homes, the President's retreat at Camp David, MD, etc.—usually precludes the casual granting of permission. Enforcement action will be taken against pilots entering prohibited areas without permission, and they also face the very real possibility of encountering intercept aircraft launched to identify them.

PROHIBITED AREA



RESTRICTED AREA



Air Force "Talon" fighters traveling at 760 feet per second fly low level foray at dawn . . .

. . . Ultralight in proximate airspace is highly vulnerable to turbulence even when apparently at a safe separation

On sectional and terminal area VFR charts, prohibited areas are usually circular or oval shapped, outlined in blue and scored with blue hash marks. There are identified by the words "PROHIBITED AREA" and a code number beginning with the letter "P." On one side of the chart, the code number is listed, along with the altitudes, times of operation, and using agency.

There are several different types of "military airspace" with different restrictions and limitations, and each has its own particular hazards for unauthorized aircraft or ultralight vehicles. **Restricted Areas** may contain military activities—such as air combat maneuvering, gunnery practice, guided missile testing—which at times could be hazardous to civilian flight. These activities are usually associated with a nearby army base, air force base, or naval air station. During active times, an unauthorized pilot or ultralight operator who penetrates such areas could find himself in the middle of an apparent war.

Aircraft or ultralights can traverse a Restricted Area with prior permission from either the controlling or using agency, usually the FAA or the service associated with the area. Restricted Areas are also indicated by blue hash marks on charts and may have irregular shapes. Several different RA's (with different altitudes) may be contained within a larger one. Their code numbers begin with "R" and their altitudes, times of use, and controlling agencies are listed in the chart legend. "Hot" and "cold" (active and inactive) times are provided to flight service stations within 100 NM of the RA by the military.

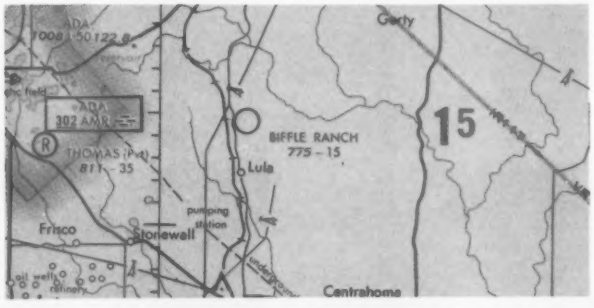
Military Training Routes (MTRs) are special routes for aerial combat training activity at high-speed (250 knots or more) and at low altitudes (below 10,000 feet MSL to the surface). MTR's are shown as VR (visual flight conditions only) or IR (flown IFR, regardless of weather conditions). IR and VR routes confined to 1,500 feet or below will be identified by a four-digit number. Above 1,500 feet they are shown by a three-digit number.

MTR's are shown as grey stripes on charts, but the size of the stripe is no indication of the width of the MTR. It may be several miles or several dozen miles wide. Furthermore, several MTR's may follow the same segments at different widths and altitudes, and the routes may dogleg while remaining the same route number. Daily scheduled activities as well as the vertical and lateral limits of the MTR is available at a flight service station within 100 NM of the route. (Identify the route by number when asking for information.) The FSS is unable, however, to give precise times that aircraft may be on a particular segment, merely the time the entire route is in use. Note that this information is given on request only.

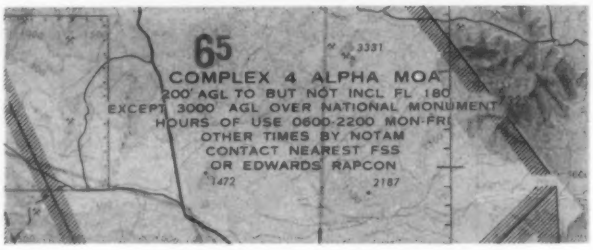
The **Military Operations Area** is airspace of defined vertical and lateral limits which is used to separate or segregate certain military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. VFR pilots or ultralight operators need no prior permission but do need to exercise vigilance when flying through MOA's because of the possibility of encountering high-performance military aircraft.

MOA's are magenta hash marks on sectional charts, and they are usually named for a nearby town, military base, or landmark; given a number; and designated MOA. For example: PICKETT 1 MOA. Their altitudes and hours of activity are given in the chart legend and can also be obtained from NOTAMs or an FSS. Temporary MOA's are established for a special training exercise, and this information, though not usually charted, is available from NOTAMs or FSS. MOA's may underlie

MILITARY TRAINING ROUTE



MILITARY OPERATIONS AREA


65
COMPLEX 4 ALPHA MOA
200' AGL TO BUT NOT INCL FL 180
EXCEPT 3000' AGL OVER NATIONAL MONUMENT
HOURS OF USE 0600-2200 MON-FRI
OTHER TIMES BY NOTAM
CONTACT NEAREST FSS
OR EDWARDS RAPCON

WARNING AREA

ALERT AREA

or adjoin a restricted area, so entering or exiting them requires special attention.

(Note: If separation can be maintained, ATC will clear IFR traffic through MOA's; otherwise, IFR traffic will be re-routed. Military aircraft are also exempted from the prohibition against aerobatic maneuvers in federal airways if the airway or portions of the airway is within the MOA.)

Established beyond the three-mile limit over international waters, **Warning Areas** have hazards similar to Restricted Areas but cannot be designated as restricted because of their international status. Flying in warning areas can be extremely hazardous to light aircraft or ultralight vehicles. Period of activity may be published as "intermittant" rather than specific terms. Vertical limits vary from low altitudes to very high altitudes. Times of use, altitudes, and controlling agency are published in the chart legend. Warning areas are outlined with blue hash marks on sectional charts and can be found off the coastlines. There are designated "WARNING" followed by a code number.

Also of concern is the **Alert Area**, where there is a high volume of military pilot training or unusual type of aerial activity. There is no restriction about flying in Alert Areas, but again pilots must be particularly cautious, and remain aware that everyone flying in the area is responsible for collision avoidance. Alert areas are outlined in blue hash marks and are designated by an "A" followed by a number on sectional charts. The vertical limit of the alert area, the controlling agency, and the times of use are in the chart legend.

Although military use areas are clearly delineated on charts, pilot navigation errors are still possible. Even military pilots, with all their super-sophisticated equipment, may still make an error. It pays to be alert whenever your flight path takes you anywhere close to known areas of military use. Camouflage makes military aircraft difficult, if not impossible, to detect. But if a pilot or ultralight operator knows where to expect such aircraft, he can keep his and his passengers' eyes open for other telltale signs—smoke trails, shadows, position lights, unusual movements, etc. It also helps to make yourself as visible as possible: If you have lights, display them. If necessary, divert around an active area; if possible, fly above or below the vertical limitations of the airspace. Lookout for the other guy, but look out for yourself, too.

Military airports (identified on charts by the service—AFB, NAS, etc.) which are not associated with restricted areas are also of concern to civilian aircraft. Highspeed military aircraft activity may be anticipated in the vicinity at any time. Some civilian airports also host Air National Guard or Air Force or Navy Reserve aircraft. These aircraft may be taking off and landing or conducting other operations on or near the airport at the same time as civilian traffic.

Civilian and military aircraft have shared the air for many years with only occasional mishap, and there is no reason to believe that ultralight operators cannot do the same, once they learn to use and read sectional charts and check NOTAMs. Once everyone concerned is aware of the possibility of each other's presence in the air, part of the job is done. The other part is assuring that you do not let up on see-and-avoid for even a second.

That second can make a world of difference. ■

Camouflaged F-4's are difficult to spot. How many do you see—one? Two? Three? More?

GENERAL AVIATION NEWS

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1979-1982

Editor's Note: For the convenience of our readers, we are providing an index of feature articles published in this magazine from January 1979 to December 1982. Subscribers who keep filed issues will find the index a valuable reference key. We have cross-referenced several of the articles.

Other readers who wish to look up an article may find bound copies of FAA GENERAL AVIATION NEWS in most large public or university libraries. Filed copies of the magazine are also available in some Flight Standards District Offices. Unfortunately, back issues are no longer for sale. However, if local resources fail, write to us directly. We will assist you in any way we can.

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Brave Bessie

First black pilot in U.S. was a lady

The fair grounds at Jacksonville, FL had an air of expectancy that first day of May 1926. Early in the morning the ferris wheel and refreshment stands were ready for their first customers, but they never appeared. Later that day the stands were draped in black, to commemorate the death of "Brave Bessie" Coleman, the intended star attraction of the show.

Atlanta, TX, a small town 10 miles from the Arkansas border, was the birthplace of Bessie Coleman on January 26, 1893. Her mother was black; her father was a Cherokee Indian. While she was still a toddler, her family moved to Waxahachie, TX where they bought a piece of land and built a three-room house.

At the turn of the century came another upheaval—her father returned to his old Indian Territory (now Oklahoma). Bessie's mother refused to leave the house she had worked so hard to make a home and was left in Waxahachie with a son and four daughters. Pinching pennies and working hard had always been the normal way of life for the Coleman's and now they knuckled under, taking in washing, ironing, and picking cotton.

Mrs. Coleman, who was unable to read, knew the value of an education and insisted that her children go to school and learn all they could. Bessie became an avid reader, devouring every book that came her way. When she finished high school her heart was set on going to college, but money was a problem.

Fired with determination "to be someone," Bessie decided that Waxahachie would not satisfy her hopes. She left for Chicago where her brother lived, and enrolled in the manicuring course at a beauty school. She later landed a job in a barber shop where she worked until the early years of World War I. At the age of 23 she was still undecided about where she wanted to go with her life. To make extra money she managed a small chili parlor, carefully hoarding her cash for the future. It was during the war that the new field of aviation caught her attention. She began reading up on the subject and the more she read the more fascinated she became. Here was scope for her ambitions!

Becoming a pilot in 1920 was not easy, as there were few women pilots, and they were not encouraged to learn. A black woman pilot was unheard of. Finding every door firmly shut against her, Bessie went to see Robert S. Abbott, publisher of the noted black journal, the *Chicago Weekly Defender*. Abbott was a flight enthusiast who knew only too well the kind of obstacles Bessie had encountered as she tearfully recounted her thwarted dream. His suggestion was simple: Go abroad! French women had been becoming pilots as early as 1909, and racial prejudice was less of a problem there. Abbott also recommended that she study French while she was searching for a flight school in France.

Within a few months Bessie excitedly translated a letter of acceptance from a school in Le Crotoy, south of Paris. After withdrawing her hard-earned savings from the bank, over the opposition of her family and bank manager, she was on her way to France.

In September, 1921 Bessie Coleman returned to this country holding a license from the prestigious Federation Aeronautique Internationale as the only licensed black pilot in the world, man or woman.

Bessie was determined to open up flight training to black people in America. She found many World War I aircraft available at bargain prices, and although her funds were low, she was able to purchase three small Curtiss planes from the Air Depot in Coronado, CA after she supervised their testing.

The only way for Bessie to raise enough funds quickly for a flight school was by barnstorming, that most dangerous occupation performed only by what were known as "air gypsies." Stunt flying brought out big crowds of onlookers who came to see accidents as well as watch stunts. Although her family was very much against this daredevil flying, nothing could change her mind. She said many times, "I am aware of the risks." Bessie agreed with Amelia Earhart's philosophy that "women should do for themselves what men already have done...thereby establishing themselves as persons."

On Labor Day weekend in 1922 Bessie Coleman staged her first American exhibition at Curtiss Field near New York City, on Long Island. A very large crowd appeared, not just to watch some more trick flying, but to see the only black woman pilot. She did not disappoint them, performing many of the daring stunts she had learned abroad. The show prompted a number of black men to call about training. These "nibbles" pleased Bessie to no end. She had started.

Six weeks later Bessie made her first appearance in what she now considered her hometown, Chicago. Thanks to good advance publicity, thousands crowded what was then Checkerboard Field to see a black woman stunt pilot do her thing—including loops, figure eights, and "Richtofen glides."

After a few more exhibitions in Chicago she decided to concentrate her efforts in the South where there had not been many air gypsies. Her next stop was Houston, TX, which she used as a base, and where she was a tremendous hit with her flying circus. In a nearby town she parachuted in the place of a white woman who had second thoughts about jumping, earning herself the nickname, "Brave Bessie." In Austin, TX she was honored by Ma Ferguson, the state's well-known governor. Stopping in her old home town of Waxahachie, she refused to exhibit until the blacks could use the front entrance, same as whites. She won her point.

Now she expanded her territory across the country, staging shows from California to Massachusetts, where she flew loops over the Charles River in Boston in honor of Harriet Quimby, the country's first woman pilot, who was killed there in 1912.

In 1924, Bessie had her first accident, in California, breaking three ribs and suffering a double fracture of her leg. After a lengthy recuperation she started out once more, with renewed dedication. to establish her school where she could train young black pilots to fly. Still lacking money, Bessie lectured in theaters, churches, and anywhere she could collect a crowd. Many exhibitions later she wrote to a sister that, "I am right on the threshold of opening a school."

In the spring of 1926 Bessie was touring in Florida where she was asked to put on a show by the Negro Welfare League of Jacksonville. As many rich, influential people would be present, one last performance would push her savings over the mark needed to open a school. She accepted.

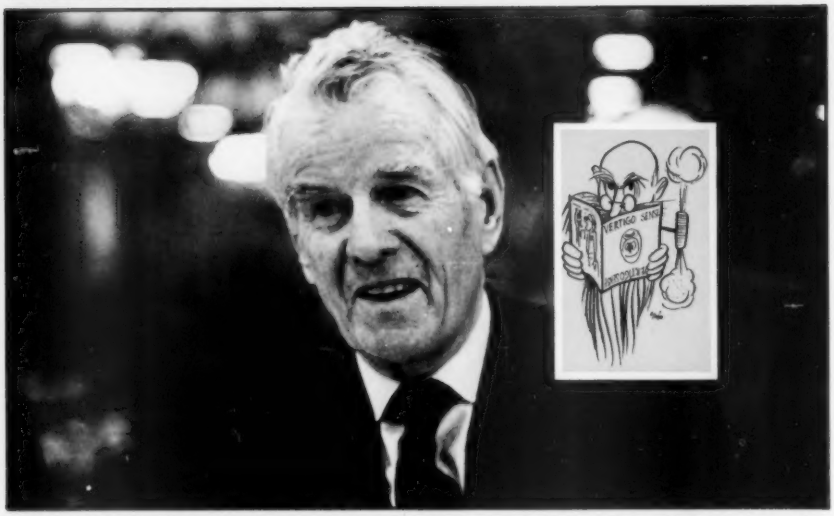
On the day before the event in a restaurant she spotted Robert Abbott, the *Defender* publisher who had started her on her career. Throwing her arms around him, Bessie proudly announced, "This is the man who gave me my chance. I shall never forget him." She felt that nothing could stop her now from realizing her ambition. Whether it was psychic intuition or just a concern over her weary look, Abbott warned Bessie not to fly the next day—a warning she ignored.

Early on the morning of the 30th, Bessie Coleman drove to Paxon Airport. Accompanied by Willie Wills, she took off on a short test run. For some inexplicable reason she did not bother to use her safety belt.

The plane tested beautifully until suddenly it flipped over during a dive, throwing Bessie 2,000 feet to her death. Wills was also killed when the plane crashed. The reported cause of the tragedy was a wrench that had dropped between the control levers.

Although life ceased for Bessie Coleman just short of her goal, the interest in aviation she had stirred up among people of her race did not die. By World War II black aviators were flying in Europe under the insignia of the U.S. Army Air Corps.

Brave Bessie had not been forgotten. ■



OUR OWN OSBORN. Robert Osborn, celebrating 40 years of aviation safety cartooning began his career with the U.S. Navy in 1942. Widely known as the co-creator of the "Grandpa Pettibone" series, Osborn has been providing **FAA General Aviation News** readers with witty cartoons since 1962.

RECURRENT TRAINING UP, ACCIDENTS DOWN IN 1983

Preliminary figures for 1982 seem to indicate a continuing downtrend in general aviation accidents. Through December 31 there had been 3,394 general aviation accidents, down from 3,760 in 1981. Fatal accidents were also down—603 compared to 674 the year before. The 1,203 fatalities were less than 1981 figures as well.

The decline in general aviation accidents may be due in part to less frequent flying because of the economic recession and the high price of fuel. However, the widespread acceptance of FAA's emphasis on pilot proficiency and recurrent training is also believed to be an important factor.

The Pilot Proficiency Award Program known as "Wings," which was formally adapted by FAA in all regions in July 1979, offers a distinctive bronze, silver, or gold-toned wings pin to all certified pilots who have voluntarily taken three hours of refresher flight training and attended an FAA sanctioned pilot seminar. Additional pins may be earned in successive 12-month periods.

An Advisory Circular (61-91B) giving complete details on the Pilot Proficiency Award Program may be obtained free of charge from DOT Publications Branch, M-443.1, Washington, DC, 20590.

SATELLITE "EAR" FOR ELT CALLS

Virginia State Police were able to quickly locate the crash site of a twin-engine aircraft with the help of—of all things—a Soviet satellite. The polar-orbitting satellite picked up the aircraft's Emergency Locator Transmitter signal and passed the location on to American search and rescue officials. Unfortunately the crash was not survivable, and all on board died on impact.

The Soviet satellite is the first of four—two Russian and two U.S.—that will orbit the Earth in an experimental program to detect distress signals and dopplar radar location data, to be passed on to appropriate ground stations.

MEDICAL CERTIFICATE CHANGE

FAA is requesting comments on a proposed rule change which would vary the duration of an airman's Third Class medical certificate according to age. The proposal is designed to lessen the burden on private and student pilots for physical examinations, every two years.

Under the proposal, private or student pilots less than 34 years of age could obtain a medical certificate valid for five years. Pilots 34 years old but not yet 35 could get a four-year certificate, and pilots between 35 and 55 a three-year certificate. For pilots over 55, the third class medical would remain at two years duration.

Comments on this proposal should be sent immediately to Office of the General Counsel, AGL-204, Docket No. 19176, 800 Independence Ave., S.W., Washington, DC, 20591.

ROTORCRAFT OFFICE ESTABLISHED

FAA has established a Rotorcraft Program Office (RPO) to coordinate all Agency activities involving helicopters.

Helicopters are the most rapidly growing segment of aviation, with 6,500 aircraft now operating and double that expected by the year 2000. The RPO will be headed by Jerold Chavkin, an FAA aeronautical engineer and commercial pilot, formerly Manager of the Aircraft Engineering Division, Office of Airworthiness.

RANDOM RNAV NOW PERMITTED

FAA has cancelled all public area navigation (RNAV) routes except certain high altitude routes in Alaska. The Agency had been allowing pilots equipped with RNAV to use individually selected point-to-point routes provided the flight could be made under radar surveillance, and determined the published routes were unnecessary.

Area navigation permits more direct en route flight through use of approved self-contained navigation systems.

SPECIAL IFR FOR HELICOPTERS

Effective January 1, 1983, Special Federal Aviation Regulation 29-3, which allowed limited IFR operations for normal and transport category helicopters otherwise restricted to VFR flight, was extended indefinitely.

Now SFAR 29-4, the amended rule allows helicopters to continue to conduct limited IFR flights provided FAA approval has been obtained, the operator abides by the conditions and limitations of SFAR, and a copy of the approval and the SFAR is included as a supplement to the rotorcraft's flight manual.

For further information contact Operations Branch, General Aviation and Commercial Division, AFO-820, 800 Independence Ave., S.W., Washington, DC, 20591; (202) 426-8194.

LATEST AVIATION PUBLICATIONS

Maintaining Visual Aids

Airport Operators will be interested in new AC 150/5340-26, "Maintenance of Airport Visual Aid Facilities." The AC provide guidelines for maintenance of various airport visual aids such as runway/taxiway lighting, rotating beacons, VASIs, obstruction lighting, etc. Free from DOT Publications Branch, M-443.1, Washington, DC, 20590.

Winter Fuel Hazards

Winter presents a number of operating problems for general aviation pilots, not the least of which is ice in fuel. Entrained water in fuel may freeze during ground storage only to stop an aircraft in flight by clogging fuel lines. Some ideas for safe winter fuel operations can be found in Advisory Circular 20-43C, "Aircraft Fuel Control," also free from DOT Publications Branch, address above.

• View of Model L

We have an Aeronca Model L based here at Des Moines' Morningstar Field. When its owner died, it fell into many years of disuse, but it is being restored to show condition by its new owner. I thought your readers might like to see what it looks like. I have enough hours in the aircraft to say it has no bad habits and is a joy to fly. It is powered by a 90 hp Warner using a Hamilton Standard prop. It will cruise 112 easy. It was—and is—a great airplane, and lots of us here in Des Moines will be glad to see it fly again.

Harold A. Lossner
Des Moines, IA

Thank you for your information and the pictures. We printed the best of the lot.

• PUMA is Powered

I would like to inform your readers that PUMA—mentioned in "The Ultralight Solution" (September/October 1981)—is now the Powered Ultralight Manufacturers Association.

Lyle Byrum
San Marcus, CA

• Fudging Time?

Concerning Max Conrad's claim of 50,000 hours: That works out to 900 hours a year for 55 years, or 75 hours a month. This is as bad as the late Dick Merrill's claim of 45,000 hours while flying for Eastern. I had 37 years as an air carrier pilot, in the Massachusetts and New York Air National Guards, in the U.S. Naval Reserve, and owned two aircraft; and I have logged "only" 32,500 hours! Perhaps some of these oldtimers logged time with an "ultralight" pen?

Capt. Wm. R. Waters,
Miami, FL

The aircraft flown by Conrad and Merrill were a lot slower than today's speedsters, so if they were logging clock time—which is allowable—they could have amassed the amounts they claim. Both men flew long stretches over water, around the world, etc.; both had started flying when they were very young. Over the years it does add up. Indeed, if you continue flying at your present rate of accumulation and are blessed with longevity, you would surpass them both.

• Legendary Mistake

The article on Tower En Route Control was great (November/December 1982), but the legend on the map was wrong—I think. You had triangles representing Radar Approach Control Areas and circles for non-radar areas. But, in looking at the chart I found places like Washington and New York that I know have radar marked as not having it. What happened?

Ned Bronski
New York, NY

The symbols in the legend were accidentally reversed. Triangles designate non-radar approach control areas; the solid dots represent areas with radar.

• Forbidden Flight

Your response to the pilot who wanted to know if enforcement action could be taken if he violated the 2,000' AGL recommendation over U.S. Fish and Wildlife Service areas and U.S. Forest Service Wilderness and Primitive Areas, although correct, may have been oversimplified.

Not only might the FAA take enforcement action, but agents of the Fish and Wildlife Service can and do make arrests for such violations; and they do take enforcement action when appropriate.

Donald Miller
Bakersfield, CA

• Dollars and Sense

Without any doubt you will receive dozens of letters expressing dismay at the latest hike in your subscription price. Let mine be among them. It seems only a year or so ago that the price jumped dramatically from $6.20 per year to $9.00. Now it shoots up to a staggering $14.00.

I know it is not the people who write FAA General Aviation News who set the price, but perhaps you could pass along to those who do the following observation:

The prestigious National Geographic, issued TWELVE times yearly with (collectively) hundreds of superbly photographed color pictures, costs about what your magazine does, with its six thin issues and no full color photos.

Dr. Newton Miller
Redlands, CA

Our price is set by the Government Printing Office, according to a schedule which enables them to recover all subscription fulfillment handling expenses, which are many. The *National Geographic*, which is superbly endowed as well as photographed, is supported heavily by advertising.

As regards dollars and cents (or sense, if you will), let me point out that many readers save time and money by obtaining information from our magazine which otherwise would cost them a great deal more. For example, the recent rule on ultralights (FAR Part 103) costs $32. It was described in detail in our September/October 1982 issue, which included a special graphic display of accessible airspace and gave a limited-time source of *free* copies of the rule. We regularly provide a direct answering service for knotty questions (like yours) that costs you only 20¢ and will result, when urgent, in a telephoned reply. There are many other savings, if you look for them.

Not to argue the merits of other fine publications, consider simply whether they are dedicated to your accident-free survival as a pilot, and how much that is worth to you and yours.

• Multi-Engine CFI

I am aware that a flight instructor applicant must demonstrate proficiency in an aircraft with a controllable propeller. I read that a jet aircraft does not qualify. If a person already holds a single-engine instructor certificate and is applying for a multi-engine CFI, can this test be given in a LearJet, for example, while the applicant is going up for an additional category rating on the CFI certificate? Please settle this argument.

John Ross
Northport, NY

As noted earlier FAR 61.45(b)(1)(2) requires the applicant to furnish an aircraft that is capable of performing each pilot operation required for the flight test (pilot operations are listed in the flight test guide for each certificate). A properly certificated aircraft must be provided since the CFI flight test might include procedures and maneuvers such as flight at critically slow airspeeds and the recognition and recovery from imminent and full stalls. These maneuvers may not be permitted by a turbojet's certificated operating limitations, and in that case the jet could not be used for this particular test.

FAA GENERAL AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA GENERAL AVIATION NEWS, AFO-807, Washington, D.C. 20591.

• Idaho Cirque

I would like you to identify the topography shown in the aerial photo, upper left, p. 4 of the article on post-crash survival (September/October 1982).

Name Withheld
Wanatchee, WA

The area shown in an alpine cirque in the Idaho Primitive Area, near Challis, ID. The photograph was taken with the assistance of Air Unlimited, Challis.

• Very Short Crosscountry

I have a commercial certificate, and I often ferry aircraft short distance, e.g., Leesburg, VA to Dulles Airport (10 nautical miles), for fuel or maintenance. Can I log such a short distance as crosscountry time?

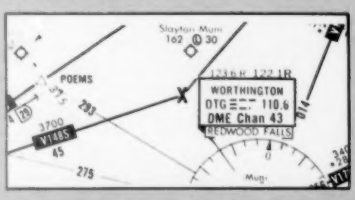
Sheila Hamilton
Purcellville, VA

For a certificated pilot rated and current in the aircraft involved, any flight that ends with a landing at a point other than the point of departure—regardless of the distance—can be logged as crosscountry time.

Instrument Corner

• X Symbol Clarified

The response in the November/December 1982 Instrument Corner to the question concerning the use of "X" symbols on instrument charts has been amended by Air Traffic as follows:



The "X" symbol is used instead of a fix for two purposes on the en route low altitude, high altitude, and area charts: 1) to indicate a point where the airway turns *by any amount* or 2) on a straight airway to show a crossing point of an international boundary when a change in the minimum en route altitude (MEA) is required (used in conjunction with the perpendicular slash). In both cases the "X" serves as a mileage breakdown point, and the mileage numbers are shown on the segment of the airway preceding the "X."

The "X" is used instead of an intersection because the turning point may not meet the minimum critieria for an intersection, e.g., 30° divergence of two radials; or simply because an intersection may not be required at that point.

The references used are the Interagency Air Cartographic Committee Specification No. 1 and FAA Order No. 8260.3B, Terminal Instrument Procedures. And further questions should be directed to FAA's Cartographic Standards Branch, AAT-210, 800 Independence Ave., S.W., Washington, D.C., 20591; (202) 426-3758.

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